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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



Survival of the Fittest

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ENGINEERING

From Now On: Publication

Printing and duplication methods which make our current mass production of information possible are due for changes in the future.

By WATSON DAVIS

Fifth in a series of glances forward in science.

► THERE are many ways that civilization differs from primitive existence. It is not alone a matter of radio, television, automobiles and frozen food.

Being able to write something down on paper is the number one ingredient of civilization. Recording in this way allows others to know, even though they be remote in time and space. The dead may speak in books, an airmail letter conquers the world's geography, and a finding of science once recorded in a published report is safe against oblivion.

Ours is truly a cellulose (paper) and carbon (ink) culture. Tons upon tons of wood are used to make the paper of our newspapers, magazines and books. The machines that decorate the paper with intelligence are wondrous in their speed, facility and perfection.

Presses whip out gigantic newspapers by the tens of thousands per hour, type is set for printing with almost as much ease as the text can be typewritten, and pictures are not only reproduced with faithfulness but flashed across continents and seas.

Mass production for printing is highly perfected, although further progress is in the making for conventional letter-press such as this magazine uses (putting ink on a raised metal surface and then transferring it to paper). Even greater promise appears in developments of lithography, rotogravure, and variations of such methods that arose out of the lithographer's stone (the area that is to print is made to attract ink while the other does not). Electronic printing is on the way, with the printing plate and the paper never quite touching but the ink rushing electrically to the right places. There are several methods under development for setting type by photography or electronic methods.

All this is highly promising for mass production publication, so long as the forests hold out.

There are many difficulties in reproduction of short-run publications that experience rising costs of typesetting and press work. Mimeograph, lithography from typewritten pages, and even very short runs of purple print, thanks to methyl violet dye, have their place. They do not solve the problem for a thousand copy circulation.

Photographic reproduction, particularly in the form of microfilm, enlargements from these pint-size images on film, or photostats, do an effective job in getting

individual copies of library material to the users.

If perfected, micro-microfilm consisting of a couple hundred pages on the area of an ordinary library card, 3 x 5 inches in size, might serve effectively scientists and scholars who would be equipped with a reading machine just as they now have a typewriter.

To keep the written words moving among us and to store the vast records of our years, we need better and cheaper duplication methods. We need a hard look at the

PSYCHIATRY

Fears of Sick Children

► SICK children suffer from three kinds of fright, in addition to their illness, Dr. A. H. Vander Veer, associate professor of psychiatry and director of the service in child psychiatry, University of Chicago Clinics, reports in the JOURNAL OF CHILD BEHAVIOR (Jan.).

Of the various kinds of anxiety felt by a sick child, the simplest kind is that felt by the child when he feels that the adults around him are frightened. The fear is communicated to him, and he "absorbs their uneasiness as quickly as if it were a highly infectious disease."

The second variety of anxiety is the well-known fear of injury by some external power. Parents often in disciplining their children threaten them with the doctor. Therefore the doctor becomes a bogey man, one who does strange things with mysterious objects and is obviously a menace to the child's safety. The bedside discussion of the child's disease and condition carried on in the medical jargon around the child is also very disturbing to him.

The third source of anxiety for the child is fear of conscience. He often feels that the sickness is punishment for some misdeeds on his part, or he feels guilty because of the expense he is causing his family by his illness.

Dr. Vander Veer advises that parents prepare their children for medical and hospital experiences by telling them in understandable language about their treatment and environment. However, a child should not be told he is to have an organ of his body removed because children have a great fear of losing part of their body.

By this method of preparation the child is not thrown into a state of fright when blood counts are taken, anesthesia is given

world supplies of pulp wood. We may not be renewing the forests which our printed matter must have to continue by the present methods and in the present volume.

For the future we should:

A. Inquire into the science and technology of all printing and record duplication methods, without the restraining influence of any existing process.

B. Do something about the future supply of paper, including a world view of forest resources, using yardsticks of time, price and technology.

C. Investigate the possibility of a synthetic paper substitute not made from wood. Paper made from growing plants is, like food, a renewable natural resource. Yet if clay, for instance, could be made into a sheet plastic for printing, it might balance better the needs of the world.

D. Consider the mounting mass of written records and the growing inaccessibility, because of bulk, of our recorded intelligence.

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PSYCHOLOGY

Clue in Childhood to Cut-throat Rivalry

► THE hungry baby who learns to fight with the neighborhood kids for the only available icecream cone may be expected to grow up to be a cut-throat competitor.

He will, that is, if observations of mice reported to the Eastern Psychological Association in Worcester, Mass., are found to apply as well to men.

Even though, as an adult, the individual may never feel the pinch of want, his baby struggle for food may cause him to fight fiercely for every morsel of gain.

The mouse experiment was conducted at the Roscoe B. Jackson Memorial Laboratory at Bar Harbor, Maine, by Dr. Emil Fredericson. There, baby mice learned to fight for a single piece of hard food given to a hungry group. The hungry mice bit each other, wrestled, squealed, and, if they could, ran away with the morsel.

When these same mice were grown, Dr. Fredericson found that they would still squabble if a group were given a single bit of food even though they were not at all hungry and a brimming hopper of food was right beside them. Other mice who had not learned to compete for food as babies did not squabble over it as non-hungry adults. There were no exceptions.

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MEDICINE

Nerve Root Transplanting

An operation in which the nerve root, instead of a piece of the fiber, is transplanted offers hope to victims of certain spinal cord injuries.

► A NEW nerve transplanting operation in which the nerve root itself instead of just a short piece of nerve fiber is transplanted was reported at the meeting of the Federation of American Societies for Experimental Biology, Atlantic City, N. J.

If as successful in humans as it was in five male Guinea baboons, it will be valuable to victims of accidental injury around the spinal cord. Some of the men who got gunshot wounds around the spinal cord in the last war might, for example, have regained lost function through such an operation if it had been developed then.

In the operation on the male baboons, a nerve root near the tail end of the spine or one of two located at the small of the back (third or fourth lumbar) was transplanted to replace the sacral nerve root which had been damaged. The sacral region is between the lumbar and tail, or coccygeal, regions. The transplanted nerve root was attached to the nerve fiber of the damaged nerve root. Within about eight months,

this nerve was able to function.

While this operation would overcome paralysis of a particular muscle or loss of a particular function, it would not cure paralysis due to destruction of cells in the spinal cord, such as occurs in infantile paralysis or in transverse myelitis.

The operation in the baboons was reported by Drs. L. W. Freeman, J. C. Finneran and L. R. Radigan of Indiana University School of Medicine and Yale University School of Medicine.

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ENGINEERING

TV Tuning Improved By Printed Circuit

► ORDINARY wiring is omitted in a new home-receiver television tuner. It utilizes printed circuits instead of wires and greatly improved performance is claimed as a result.

Printed circuits, a relatively recent invention, do not use wire to transmit electrical currents but utilize, ordinarily, painted or printed tracks of metallic ink on a plate. The printed circuit is a two-dimensional affair, an important advantage being that it saves space. The new tuner is an RCA product, and for it a photo-etch process was developed to obtain the printed circuit.

The new tuner is a radical departure from conventional wound-coil units. With tuner design involving 12 channels, each containing four tuned circuits, the printed circuit is especially well adapted to manufacture. In design, it is a small cylindrical turret-type affair. The turret employs individual coil strips or segments, each containing the printed circuit for a separate channel.

The photo-etch process developed for the RCA printed-circuit tuner begins with the photographing of a circuit drawing. A contact print is then made from the negative in a copper-clad sheet of phenolic plastic which is coated with a light-sensitive material.

The next step is the developing of the plastic sheet and then placing it in an etching solution. The solution eats away that part of the copper not covered by the pattern of the circuit, leaving the required copper circuit on the sheet.

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MICROSCOPY

Small Size, Low Cost in New Electron Microscope

► LABORATORY and industrial research will be greatly extended with a new small-size, relatively low-cost electron microscope developed in Camden, N.J. by Radio Corporation of America.

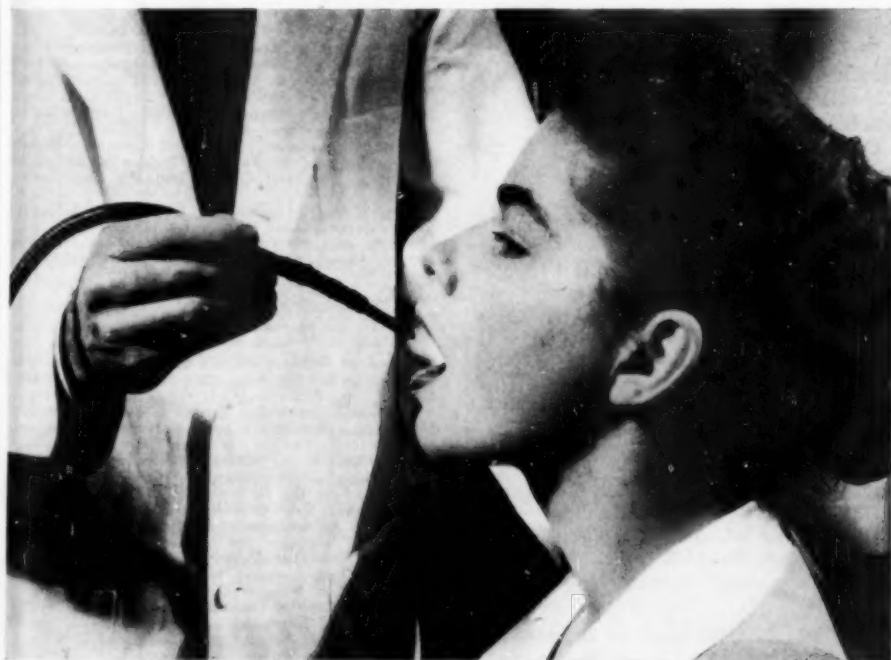
It will sell at a price low enough to permit its use by many institutions that can not afford the older full-size instrument.

The invention of the electron microscope, perfected for actual use about a decade ago, was hailed as one of the greatest achievements in science of the period. By using electrons instead of light, it permitted the examination of animal, plant and mineral structures which ordinary microscopes were entirely unable to detect.

Objects under the new instrument were magnified some 40,000 times. By means of photography these magnifications were much increased.

This new table-model electron microscope magnifies 5,000 times. Magnifications up to 50,000 diameters can be obtained by photographic enlargement. The instrument is more than 20 times as powerful as the best optical microscope, and has a depth focus 150 times as great.

While not as powerful as the full-size electron microscope, it will cost only about one-third as much. Another advantage of the new instrument is the fact that the



GEIGER COUNTER CANCER DETECTION—A tiny geiger counter is used to search for cancer of the stomach. The instrument is swallowed by the patient and indicates concentration of radioactivity, induced by isotopes, in stomach wall. Nurse Rosemary Quigg poses as the patient. The counter was developed by Dr. Seymour Gray and Dr. Charles Robinson of the biophysics laboratory of Harvard Medical School and the Peter Bent Brigham Hospital, Boston.

lower end of the magnification range overlaps that of the conventional light or optical microscope, permitting the student to progress by stages from the known to the unknown.

An important feature of the instrument is the use of permanent magnet lenses requiring no stabilization circuits and controls, according to Dr. Robert G. Picard of the RCA laboratories.

Marked simplicity is achieved without

sacrifice of high-quality performance, he stated, by means of a combination of design factors centering around an entirely new electron optical system employing permanent magnet lenses instead of the conventional electromagnetic or electrostatic lenses. Through the use of these permanent magnets, unusual stability is permanently achieved. Voltage stabilizers, current regulators, power supplies, coil windings and many controls are eliminated.

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PSYCHOLOGY

UN Atmosphere Analysis

► THE group atmosphere in United Nations meetings is not conducive to a thoughtful consideration of the merits of proposals, Dr. Lillian Wald Kay, psychologist of Washington Square College, New York University, told the meeting of the Eastern Psychological Association in Worcester, Mass.

Her conclusion was based on a scientific analysis of the official summaries of the debates on atomic energy of the "Ad Hoc Political Committee" of the United Nations General Assembly in November, 1949, after President Truman had announced that an atomic explosion had occurred in Russia. Only one out of five of the statements made dealt with a discussion of the proposals.

The Communist countries attempt to dominate such proceedings "by sheer force of words," Dr. Kay found. The Soviet Union had the floor for 21% of the time, contributing 109 statements out of the 217 contributed by the Sponsoring Powers.

"Although the casual newspaper reader is not always aware of it," Dr. Kay commented, "other countries than the big five do contribute to U. N. discussions." Altogether, there were 518 units of discussion, 301 not contributed by the Sponsoring Powers being divided among 32 other countries.

All the remarks, Dr. Kay found, could be placed in five categories of content: review of the past history of the Commission; discussion of the proposals; discussion of the characteristics of atomic energy; prestige appeals (reference to prestige figures) and discussions of motivation.

Only 113 of the 563 ideas expressed—20%—had to do with evaluation of the proposals, although 19 countries, including the five Western Powers, concentrated their discussion in this category. Review of the past history of the Commission was primarily a Western device. Of the 29 items in that category, 20 were contributed by the five Western Powers. Censure of the Soviet Union was often implied in these reviews, but rarely, if ever, overt.

The use of prestige references was restricted to the Soviet Union delegation.

The discussions of motivation nearly all attributed evil motives to other delegations. This was also primarily a Soviet device, it was found.

Outcome of the discussions was a failure to break the impasse on the question of atomic energy.

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The small amount of sulfur in an egg is sufficient to cause the tarnishing of silverware; the tarnish is silver sulfide.

Question Box

ENGINEERING

What now makes possible cheaper, smaller TV sets? p. 268.

ENTOMOLOGY-PLANT PATHOLOGY

What is the consensus regarding the Food and Drug hearings? p. 263.

MEDICINE

What effect do ultrasonic beams have on gallstones? p. 261.

What is the good news about paraplegics? p. 268.

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PSYCHIATRY

What are the three kinds of fright from which sick children suffer? p. 258.

ZOOLOGY

What is the purpose of the rat movies? p. 261.

Photographs: Cover, U. S. Public Health Service; p. 259, Harvard University News Office; p. 261, Westinghouse Electric Corporation; p. 263, Bell Telephone Laboratories.

RADIO

Saturday, May 6, 3:15 p. m. EDST

"Adventures in Science" with Watson Davis, director of Science Service over Columbia Broadcasting System.

Dr. Kirby S. Howlett, Jr., President of the American Trudeau Society of the National Tuberculosis Association, will talk on "Chemicals Against Tuberculosis".

(This program, originally scheduled for April 22, was postponed due to baseball.)

Staypak is a coined word for a hard wood made by compressing softwoods.

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MEDICINE

Beams Treat Gallstones

Gallstones, and probably kidney stones, can be shattered into tiny fragments by ultrasonic beams in one-fourth of a minute.

► PATIENTS with gallstones and others with kidney stones may in future be successfully treated by high frequency sound waves instead of by surgery or medicines.

This possibility appears from studies reported by Dr. Harold Lampert of the Yale School of Medicine, and Drs. Herbert F. Newman and Ralph Eichhorn of Beth Israel Hospital, New York, at the meeting of the Federation of American Societies for Experimental Biology, Atlantic City, N. J.

Gallstones, and perhaps kidney stones, can be shattered into tiny fragments in 15 seconds by an intense ultrasonic beam, these doctors reported. The fragments of the gallstones could pass into the intestines and be excreted through natural elimination.

The method has not yet been tried on patients because of lack of suitable equipment.

Some expressly designed for the purpose is now being developed by the Crystal Research Laboratories in Hartford, Conn.

In trials on dogs, the doctors cut open the belly and introduced the ultrasound beam through this opening to the gallbladder. The tissues surrounding the gallstones were not damaged. Both dogs and rabbits treated with ultrasound recovered without ill effects.

The tissues surrounding the gallstones are not damaged, the doctors found, when the ultrasound is transmitted through water. This is because living tissue is as elastic as water and seems to "roll with the punch," stretching without splitting on impact with the beam. Solid gallstones, however, are cracked and fragmented.

The procedure will not be noisy because ultrasound waves cannot be heard by the human ear.

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ZOOLOGY

Rats Are Dead End Stars

See Front Cover

► RATS are starring in a series of seven movies which would never get by Hollywood's Johnston office. In sets built "on location" on Oatland Island off the coast of Georgia, more than 2,000 rats are playing the story of their lives.

The purpose of the movies, produced by the Public Health Service and the Army Medical Department, is for training civilian and military personnel in the control of rats and ratborne diseases. The first film, "The Rat Problem," summarizes the seriousness of the damage to life, health and property caused by rodents. It shows rats engaged in their customary activities, contaminating food, destroying property, making love, producing little ones and fighting. An actual scene showing two rats engaged in a death struggle from the first of a series of rat control movies is shown on this week's cover of SCIENCE NEWS LETTER. As the fight progresses, both rats seem literally to stand on their tails. The rat at the left is lunging at the throat of his opponent. The fight will be climaxed when one sinks his fangs deep into the other's throat.

Through actual case histories, the film also traces the manner in which rats spread murine typhus fever, plague and other ratborne diseases affecting man.

Science writers—turned movie columnists for the day—visited the sets. Housed

in two large Army tents, these sets realistically portray the roof, attic, kitchen, living room, bedroom, basement and other parts of a house.

Later films in the series will show the habits and characteristics of the two most common rats found in the United States, roof and Norway rats. They also will portray the various means of control, including sanitation, rat-proofing, rat killing and DDT dusting.

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MEDICINE

Muscle Weakness Disease Treated by Gas Chemical

► A NEW chemical which may be related to some of the military "nerve gases" still on the secret list is proving a valuable medicine for the muscle weakness disease, myasthenia gravis.

The chemical is octomethyl pyrophosphoramide, or OMPA for short. It restores muscular strength to myasthenia gravis victims by stimulating the nervous system and muscles through reaction with a body chemical, cholinesterase. Patients are able to lead normal active lives during treatment and in some cases OMPA may have halted the progress of the disease. If this proves true, it may be a "cure" for the condition.

OMPA and its effects in myasthenia

gravis were reported by Drs. Kenneth P. DuBois and John Doull of the University of Chicago's Toxicity Laboratory at the meeting of the Federation of American Societies for Experimental Biology.

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HOME ECONOMICS

Powder Makes Clothes Resistant to Soil

► CLEANER cotton clothes on washday are promised from a white powder that can be added to the laundry rinse water.

Known as CMC, or carboxymethyl cellulose, the new rinsing treatment may be used in the home, by commercial laundries or by textile manufacturers. The powder should not be added to soapy water, however, since it might turn the soap into a jelly-like mass, and leave the clothes gummy.

CMC gives the fibers a smooth coating, making them more resistant to soil. It is the result of research at the Institute of Textile Technology, Charlottesville, Va., sponsored by the U. S. Department of Agriculture.

About three level tablespoons of CMC to each gallon of rinse water improves the soil resistance of the goods without changing the feel or appearance of the fabric, department officials state. CMC is available in wholesale lots, but has not yet come on the market in small packages for home use.

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SHOWERS ON DEMAND—The rooftop weather laboratory of the Westinghouse Electric Corporation borrows a leaf from April's notebook in putting new street lighting units through pelting rain tests. Engineer George Horton demonstrates the outdoor shower bath arrangement set up to douse new lights from all angles to make sure hard rains will not interfere with their efficiency.

MEDICINE

Accurate Cancer Detection

➤ A NEW and promising aid in the detection of cancer was reported by a four-man University of California at Los Angeles scientific team to the American Association for the Advancement of Cancer Research meeting in Atlantic City.

Dr. Harry S. Penn, research associate in zoology at U.C.L.A., began the original experiment 15 years ago. The test is called the "Penn sero-flocculation reaction."

To make the test, a small amount of blood is withdrawn from a patient and the plasma separated out. This plasma is then mixed with the lipid fraction, a fatty-like substance derived from the liver of a patient who has died of cancer. If the plasma remains clear, the reaction is positive. But if it clouds up and becomes murky, the reaction is negative.

The serum reaction has been tried on more than 4,500 patients. Among these were 1,000 normal persons who showed a 99.5% negative reaction; and 830 known cancer cases that gave 98.6% positive reaction.

More than 2,500 cases of non-cancerous diseases and conditions were studied. Hospitalized cases of arthritis, liver disease, active tuberculosis, syphilis, pregnancy and others produced, on the average, approxi-

mately 13% "false positive" reactions.

The new reaction is not now available as a practical blood test for cancer. Much additional work remains to be done in the technical refinement of the reaction. The supply of the lipid fraction is extremely limited. All presently available lipid material is needed for future evaluations of the reaction. The Penn sero-flocculation reaction cannot now be substituted for diagnosis of cancer by examining tissue under a microscope.

Work on the new reaction began in 1935 in a basement room in Dr. Penn's Los Angeles residence. There it continued under difficulties for nearly 10 years. In 1944, however, the study became affiliated with U.C.L.A. and since then has been supported by the Jewish Fund for Medical Research, David R. Trattner of Los Angeles, the Veterans Administration and the U. S. Public Health Service. Approximately \$150,000 has been spent on the research to date.

Joining Dr. Penn in the research were: Dr. George C. Hall, director of the Tumor Control Center, Veterans Administration Facility, Los Angeles; Dr. Andrew Dowdy, professor of radiology; and Dr. Albert W. Bellamy, professor of zoology.

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MEDICINE

Chemical for Cancer

➤ SEARCH for a chemical cure for cancer has led scientists to investigate fungi; disease-causing viruses; male, female and adrenal hormones and synthetic chemicals from the textile industry.

One of these synthetic chemicals, called SK 1133, caused complete regression, or disappearance, of almost 100% of the highly malignant cancers called sarcomas, about 80% of carcinomas and about 40% of carcino-sarcomas in rats, Drs. Kanematsu Sugiura and C. Chester Stock of Sloan-Kettering Institute for Cancer Research, New York, reported at the meeting of the American Association for Cancer Research, Atlantic City, N. J.

A related chemical, SK 1424, was almost as effective. The value of both chemicals in treating animal cancers was definitely greater than that of nitrogen mustard.

The virus of Russian Far East encephalitis, cause of the brain disease sometimes called sleeping sickness, also showed striking anti-cancer activity, completely checking the growth of some animal cancers, though it was ineffective against others. The anti-cancer activity of the virus, however, is tied up with its disease-causing activity. The cancer in the mouse would be completely destroyed but the animal would always die of the virus infection. Study of this virus

was reported by Dr. Stock and Dr. Alice E. Moore.

Anti-cancer but also toxic to the test animals was a substance from a fungus, *Aspergillus fumigatus* 943, investigated by Dr. Stock with Dr. H. Christine Reilly.

More encouraging was the report that mice expected to develop cancer of the outer part of the adrenal gland can be protected from this fate by pellets of male and female sex hormones and adrenal cortical hormones. Search for a substance with strong tumor-preventing effect without being a "strong sex hormone" is continuing and the outlook, Dr. George W. Woolley of Sloan-Kettering reported, is hopeful.

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NUTRITION

Farm Animals Better Fed than People

➤ RECENT developments in feeds for America's farm animals have brought better diets to the barnyard than most people enjoy, the National Farm Chemurgic Council was told in Washington.

Progress in vitamin studies, particularly on vitamin B-12 in the so-called "animal protein factor," in wider use of amino acids

and in knowledge of mineral requirements of farm animals was described by Dr. H. J. Prebluda, nutritional chemist for New York's U. S. Industrial Chemicals Corp. He predicted that the coming decade would be called "the fortified fifties."

"If as much interest could be aroused in feeding our population as in baby chicks and hogs," said Dr. Prebluda, "we would not only be the best fed nation on earth, but we wouldn't worry over crop surpluses."

Dr. Karl D. Butler, farm counselor from Ithaca, N. Y., said much the same thing in a second speech: "Livestock are fed better, from the standpoint of nutrition, than are people."

Science has boosted U. S. food output even though total acreage of vital crops has dropped in the past two decades, he said. Among developments to come, he predicted much greater use of yeast fermentation methods for producing protein foods from present crop and forest wastes.

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MEDICINE

Disease Germs Tried In Battle against Cancer

➤ DISEASE germs are the latest weapon now on trial in the battle against cancer and cancer-like diseases such as leukemia.

A young man near death from leukemia got two more months of life after infection with a red blood-cell-destroying strain of staphylococci. During the extra two months he felt fine, showed no sign of disease and played tennis and football. Then the leukemia started up again and eventually he died.

Trials of this kind with a few patients dying of cancer or leukemia are under way at the University of California. Object of the trials is to learn more about the ability of some disease germs to stop cancer temporarily in some cases.

For more than 50 years there have been occasional cases of cancer patients recovering temporarily after getting some germ-caused disease. Now that sulfa drugs, penicillin and other antibiotics are available to control the infectious disease, the doctors feel they can start the infection in a few cancer cases for study of this situation.

The studies are under the direction of Dr. Michael B. Shimkin.

A few transient improvements have been achieved so far in a small percentage of the cases.

Seven children, fatally ill with acute leukemia, enjoyed temporary remissions and lowered white blood counts after virus therapy. Two of them, one in dying condition, staged rallies which lasted two or three months after they contracted chicken pox. Five others were given a cat pancytopenia—a virus-caused disease of cats which knocks out white blood cells. For a while it stopped the bleeding in some of the patients and made them feel better.

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ENTOMOLOGY-PLANT PATHOLOGY

Chemicals Vital to Farm

That insecticides, fungicides and herbicides are necessary to successful farming is the consensus of opinion in the Food and Drug hearings.

► THE nation's fruit and vegetable growers would fight a losing battle without chemicals to help them beat back insect pests and plant diseases.

This will be the testimony, essentially, of specialists from 20 major U. S. chemical companies as they appear in the next month at Food and Drug Administration hearings which reconvened April 24.

The hearings, first begun in January, are part of an extensive Government survey of crop-control compounds used on today's farms and orchards. Goal of the investigation is to learn which of such substances may be poisonous or harmful to human consumers, and in what amounts.

More than 125 agricultural chemicals, among them such potent new substances as DDT, 2,4-D and parathion, are being studied.

The chemical companies' assertion that such insecticides, fungicides and herbicides are vital to successful farming has been backed up solidly in the first three months of the hearings. Technical experts from the Department of Agriculture, followed by representatives of more than 20 state agricultural offices and research stations and a dozen farmers and distributors associations, have said the same thing.

Unless insects and crop diseases are fought by farmers and growers, they testified, the amount of food fit for human consumption would be drastically reduced. And chemicals, in many cases, are the only effective weapons against such natural enemies.

The hearings, still in the first of five stages, are expected to last the better part of a year. They constitute the most far-reaching survey to protect the public against harmful amounts of agricultural chemicals since the protracted hearings on lead arsenate more than a generation ago.

Part A is concerned only with evidence on the necessity for using insecticides and similar chemicals against fruit and vegetable pests and diseases. Part B will seek to show which ones could be poisonous or harmful to humans.

The third section of the study will investigate what amount of such poisonous compounds could reach the public by being carried on fruits or vegetables. Part D will show how much could be allowed before the consumer would be harmed.

After a final phase on evidence not previously covered, the Food and Drug Administration will begin sifting the testimony.

Final result will be a set of regulations stating the permissible amounts of chemi-

cal residues on fruits and vegetables traveling in interstate commerce from farm or orchard to the dinner table.

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MATHEMATICS-ENGINEERING

Giant Brains Now Detect Own Mistakes

► SO-CALLED "giant brain" electronic computers that solve intricate mathematical problems in seconds really have no ability to "think," but a new device will give them ability to detect their own mistakes and correct them.

The new device was revealed in New York by the Bell Telephone Laboratories where it was developed. The discovery is regarded as the most important and fundamental advance in computer techniques since the development of these powerful scientific tools, Bell engineers declared.

It is also expected to be of significance

in the general communication field where transmission is on a code basis.

Errors in the electronic computers usually occur when a vacuum tube burns out or a switch fails to open or close properly. When this happens, some of the modern calculators will retrace their steps to the last check point and try again. If the same mistake recurs, they will stop and flash a light or ring a warning bell. The best these computers can do is to recognize when they make a mistake.

The new device, Bell scientists state, makes it possible for the computer not only to recognize that it has made a mistake and record that fact, including the approximate location, but to correct the error and proceed to the right answer.

The basic concepts underlying the new technique are the direct result of pure mathematical research carried out by Dr. R. W. Hamming of the laboratory staff. Apparatus incorporating the mathematical discovery was constructed under the direction of B. D. Holbrook, Bell research engineer.

The device is of course an intricate affair which few except electronic engineers can fully understand. The laboratory model already constructed is designed to catch and correct one mistake and to catch, but not correct, two simultaneous mistakes. Two mistakes at the same instant are an extremely unlikely occurrence.

Science News Letter, April 29, 1950



INCREASE IN EFFICIENCY—Modern computers have been endowed with a new faculty. They are able now not only to detect their own mistakes but actually to correct them. Dr. R. W. Hamming (left), Bell Laboratories mathematician was responsible for the research behind this achievement, and B. D. Holbrook (right), engineer, supervised the construction of the apparatus. The discovery is regarded as one of the most important and fundamental advances in computer techniques since the development of these tools.

MEDICINE

Getting 'Flu Depends on Normal Mucous Secretions

► **WHETHER** or not a person gets influenza when it is going the rounds seems to depend in part at least on substances in the normal mucous secretions of his nose, throat and breathing tract generally.

One of these substances can check the infection-causing ability of the PR8 strain of influenza virus. Another of these substances can increase the ability of this 'flu virus to cause infection when injected into mice.

Enough of the first substance may keep up resistance to influenza, while too much of the second substance may make a person more susceptible to the virus.

Discovery of these two substances and a third one with little or no effect on the infectious property of the virus was announced by Dr. Harry M. Rose of the College of Physicians and Surgeons, Columbia University, at the meeting of the Federation of American Societies for Experimental Biology.

Science News Letter, April 29, 1950

ENTOMOLOGY

Grasshopper Menace Great This Year

► **SPOTTED** in red, blue and yellow across 20 states on a map released by the Department of Agriculture are the areas where grasshoppers are expected to hit hardest in 1950.

Favorable summer weather last year for grasshoppers, followed by a mild winter, makes crop and rangeland damage almost a certainty, the Department's division of grasshopper control in Denver indicates.

Heaviest grasshopper belt will be mid-way across the continent, in a giant V from Texas north to Montana on the west and Minnesota to the east. From that line west to the Pacific, the Department warns, every state will have isolated areas where grasshoppers will be a menace.

Science News Letter, April 29, 1950

AGRICULTURE

Plant Corn at Normal Time, Beat Pesky Corn Borer

► **FARMERS** can best beat the corn borer by planting their corn in the normal spring sowing season, researchers at the Iowa State College Agricultural Experiment Station report.

Drs. G. F. Sprague, J. H. Lilly and David Rubis, studying effects of planting dates on corn yields, looked also to see how planting time might influence damage by the stalk-shredding, ear-munching European corn borer.

"Don't plant first. Don't be last," they

advise in the journal, *IOWA FARM SCIENCE*. The pesky borer produces two major flights of moths in the spring.

Corn planted very early will be just high enough to be attractive to the first squadrons, looking for stalks on which to lay their eggs. Late-planted corn will be prime targets for the second invasion of pregnant moths.

Of course, planting could be delayed until after the second borer flight. But that would cut final yields more than would damage by borers, the scientists say.

"There is no special planting date that is a cure-all," their report concludes.

Science News Letter, April 29, 1950

CHEMISTRY

Chemicals Fight Fungus, Save Money, Add to Yield

► **EFFECTIVE** fungus-fighting chemicals that promise to increase America's fruit and vegetable crops and save millions of dollars annually were described to the American Chemical Society in Philadelphia by Dr. Wendell H. Tisdale of Du Pont's Grasselli Chemicals Department, Wilmington, Del.

The fungicide compounds, which are derivatives of dithiocarbamic acid widely used in the rubber industry, can protect corn, peanuts, onions, cherries, cranberries, apples, as well as lawns.

These organic sulfur compounds, on which Du Pont laboratories have worked since 1931, compare in fighting mildews, rusts, smuts, blights, scab and rots of plants with DDT and its relatives in the insecticide field.

Science News Letter, April 29, 1950

METALLURGY

New Alloy, Principally Zinc, Is Strong as Brass

► **A NEW** alloy, principally of zinc, has approximately the same strength and electrical characteristics as brass, Dr. R. H. Harrington, General Electric scientist, revealed in Schenectady. It has, he said, about eight times the useful strength of any zinc alloy now in use.

Small quantities of copper and beryllium are added to the zinc in the new alloy. The resulting metal has a springy, resilient quality. It is suitable for use in lamp and socket fuses, panels, containers, mild springs and other forms of hardware. It is cheaper than brass, but is claimed to be a good substitute in certain applications.

The development of this alloy means wider uses for zinc in engineering and construction. Zinc ores are widely distributed throughout the world and over 1,500,000 tons of the metal are produced each year.

Its principal job now is as a protective coating on steel sheets and wire in the galvanizing industry.

Science News Letter, April 29, 1950

IN SCIENCE

PSYCHOLOGY

Baby's Consonants Show Development of Speech

► **YOU** can be more proud when your baby utters "B-b-b-b," "G-g-g-g" or gurgles other consonants than you are of his "Oo's," "Ah's" and other vowels.

Addition of new consonants to the baby's repertoire shows his development toward talking better than increase in vowel sounds, Dr. Regina Molloy Fisichelli, of Fordham University, reported to the meeting of the Eastern Psychological Association in Worcester, Mass.

Best sign of speech development is the ratio of consonant sounds to vowel sounds, Dr. Fisichelli found in a study of 20 babies, in institutions, of each of the following age levels: six months, nine months, one year, 15 months and 18 months.

Babies at home develop more rapidly in this before-talking speech than do the babies in institutions, she observed.

Science News Letter, April 29, 1950

MEDICINE

Nerve Gas Victims Need Rapid Treatment

► **THE** effect of military "nerve gases" cannot be reversed. The victim of such a gas must be treated within the first three minutes if he is to be saved.

This is one of the few bits of information which the Army Chemical Corps has declassified about these gases. It was not mentioned by Maj. Gen. Anthony C. McAuliffe, chief of the Chemical Corps, in his speech before the American Chemical Society in Detroit.

Other bits of information that have been declassified suggest that these gases do more than "destroy the enemy's will to resist."

A chemical which the Army calls "an example of a nerve gas" is DFP, short for diisopropyl fluorophosphate. When it turned out that this was not successful as a war gas, much information about it was declassified. DFP affects nerves, and has psychological effects. But in large doses it also kills. It is fast-acting and highly toxic, although small doses can be used in treating certain diseases. Some of the newer insecticides, newer than DDT, were also probably candidates for a military role as nerve gases in the early stages of their development and testing. These chemicals also are poisonous.

All this suggests that the new, still secret nerve gases may be lethal as well as will-destroying. How they are used may be what determines whether they put the enemy out of action or destroy him.

Science News Letter, April 29, 1950

NE FIELDS

MEDICINE

Platelet Masses May Be Basis Fatal Blood Clots

► WHITE masses of platelets in the blood stream may be the basis of the sometimes fatal blood clots after surgical operations or injury, Dr. Brenton R. Lutz, Dr. George P. Fulton and Mr. Robert P. Akers of Boston University reported at the meeting of the Federation of American Societies for Experimental Biology.

Platelets are normal constituents of the blood.

Discovery of the platelet masses developing after various kinds of injury was made in studies on blood circulation in hamsters. Color motion pictures with high power microscopes and light were used to record the building up, channelling and breaking down of the platelets and their passage through the lungs and heart.

Science News Letter, April 29, 1950

MEDICINE

Find Best Kind of Digitalis for Heart

► BEST digitalis preparation for the usual treatment of patients with congestive heart failure is amorphous gitalin, five doctors from New York University College of Medicine reported at the meeting of the Federation of American Societies for Experimental Biology.

Gitalin is a mixture of chemicals obtained from an aqueous extract of the foxglove plant, or digitalis purpurea as botanists term it.

Its great advantage over other digitalis preparations seems to be that it is not so toxic and patients who get sick from other digitalis preparations can go on taking this one.

The studies comparing gitalin with other digitalis preparations were reported by Drs. R. C. Batterman, A. C. DeGraff, L. B. Gutner, O. A. Rose and J. Lhowe.

Science News Letter, April 29, 1950

ASTRONOMY

New Star Bursts Forth

► WITH an energy outpouring of more than a million suns a gigantic "new star" explosion has burst forth in the southern heavens. The nova was picked up among the million stars of the southern galaxy through use of the Schmidt reflector at Tonanzintla National Astrophysical Observatory in Mexico, which is equipped

with the largest prism in the world, one of 26 inches.

It takes over 2 million years for light from this nova to reach the earth.

News of the discovery was telegraphed to the Harvard Observatory, clearing house for astronomical information.

Sr. Guillermo Haro found that the new object was magnitude 14 when photographed March 15 and 20.

The report from Director Luis E. Erro, of the Mexican observatory showed that the nova is in galaxy number 83 in Messier's catalog and that it is nearly 30 degrees south of the celestial equator in the constellation Hydra on the border of Centaurus.

The nova just discovered is of intermediate intensity. Ordinary novae are about a twentieth as bright, while the supernovae, only about 40 of which are known, average a hundred times brighter.

Science News Letter, April 29, 1950

ASTRONOMY

Very Faint Periodic Comet Rediscovered

► REDISCOVERY of a periodic comet, in just the place it was predicted, was announced by Harvard Observatory.

Of the seventeenth magnitude, far too faint to be seen by the naked eye, the comet returns every 6.7 years. It was rediscovered on April 14 by Dr. G. Van Biesbroeck of McDonald Observatory in Texas. The faint object revolves between Mars and Jupiter, getting a little closer to the sun than Mars.

D'Arrest periodic comet, as it is known, will make its closest approach to the sun on June 6, coming to within 128,000,000 miles of the sun. On July 3, it will come to within 113,000,000 miles of the earth.

Science News Letter, April 29, 1950

AERONAUTICS-MEDICINE

Counter-Pressure Suits May Treat Circulation

► ANTI-G suits, or counter-pressure clothing, developed for aviators during the war, may prove useful in treating blood circulation diseases such as Buerger's disease.

Studies suggesting this were reported by Drs. J. P. Henry, O. H. Gauer and E. E. Martin of the Aero Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio, at the meeting of the Federation of American Societies for Experimental Biology.

The rhythmic inflation of the clothing increases the blood pressure in the veins of the feet to a greater extent when a person is seated than walking about. Increased pressure in the veins helps drive the blood from the feet and legs back to the heart, thus aiding circulation.

Science News Letter, April 29, 1950

ARCHAEOLOGY

Roman Statues Work Of Greek Artists

► STATUES portraying great personalities of ancient Rome were actually made by Greek artists, Dr. Gisela M. A. Richter of the Metropolitan Museum of Art, New York, told the American Philosophical Society meeting in Philadelphia.

Heads are portraits of Roman individuals but the bodies were copied from idealistic Greek creations of the 5th to 2nd century B. C. The Roman statues are the concluding chapter in a long Greek tradition.

Progress in science is determined by events in the brains of its great men, but these brains depend upon the times in which they live for their effective productivity, Dr. Edwin G. Boring, Harvard University psychologist, declared.

The process of creative thinking involves insight and error, leading to insight and success. Dr. Boring likened this process to the trial, error and success of a rat in a psychologist's maze.

Science News Letter, April 29, 1950

PLANT PATHOLOGY

Incurable Virus Destroys Elms

► A DEADLY, incurable virus disease is destroying thousands of American elm trees in the Midwest. At least 15 states from West Virginia to Nebraska have the infection, states Dr. J. C. Carter, plant pathologist with the Illinois Natural History Survey.

Known as Phloem necrosis, the disease cannot be cured by any known method. No diseased tree has ever been known to recover.

Dr. Carter tells of Illinois cities and towns losing 300 to 400, or even more elm trees each year after the disease made its appearance. Springfield, Ill., held a community-wide "Dead Tree Day" last fall to remove elms killed by the virus.

The infection usually exists in a tree for a full year or more before symptoms appear, Dr. Carter said. After the first signs appear, however, the tree will die within days or weeks.

The U.S. Department of Agriculture in 1947 pinned transmission of the disease on one of the small insects known as leaf hoppers. This hopper apparently picks up the virus while sucking sap from infected elm leaves.

Thus science's only present hope for checking Phloem necrosis is control of the leaf hopper, Dr. Carter said. Special DDT sprays have been found effective by the Department of Agriculture. They must be blasted on the trees in large amounts and at high pressures to reach the insects on the undersides of leaves.

Science News Letter, April 29, 1950

ANTHROPOLOGY

Evolution Trial Relived

The Scopes case, in which the freedom of science was on trial, finds its present counterpart in the loyalty oaths, greater classification and growing attitude to reject science.

By WADSWORTH LIKELY

➤ TWENTY-FIVE years ago—on April 24, 1925—a young high school teacher named John Thomas Scopes was indicted by a grand jury in Dayton, Tenn.

He was indicted for the crime of "unlawfully and willfully teaching in the public schools of Rhea County, Tenn., . . . a certain theory and theories that deny the story of the divine creation of man as taught in the Bible and did teach instead thereof that man is descended from a lower order of animals."

Two and a half months later, on July 10, in Dayton there began what was known as the "monkey trial." No trial in history up to that time, and few since, have so excited the interest of the people. Millions of words were written about Scopes, about his defense counsel—Clarence Darrow, Dudley Field Malone, Arthur Garfield Hays—about the Great Commoner who allied himself with the prosecution, William Jennings Bryan.

The trial began as a test case—a test of whether a law-making body had the constitutional power to prevent the teaching of what all recognized scientists said was one of the most fundamental facts of nature, if that fact contradicted some religious beliefs.

Evolution vs. God

The fact in contest was, of course, evolution—that man descended from a lower order of animals, that this descent took millions of years. Evolution was, to the Fundamentalists, a denial of God's word, the Bible, which says that man was created by God, as he is today, out of the dust of the earth.

On March 21, 1925, Tennessee had passed a law making it a crime to teach the evolution theory in any schools supported in whole or in part by the state. To many of the people in Tennessee, this was a reasonable act. To some other people all over the country, whether they believed literally in the Genesis story of creation or in the scientific story, it was reasonable that a legislature should prescribe what is to be taught in the schools.

But to Scopes, and to the array of legal talent behind him, and to the scientists of the country, no law-making body on earth had the right to prevent the teaching of what they thought to be the truth to the young people of the country. And, if a law-making body did try this, they passionately believed the freedom of science was in

danger, and hence the freedom of all the people was in danger.

Anti-Evolution Laws Still Valid

That anti-evolution law is still on the books of the state of Tennessee, and similar laws are still valid in other states. John Thomas Scopes was found guilty and fined under that law. The State Supreme Court upheld its constitutionality.

But who really won? Science or religion?

Twenty-five years later, most people, including the scientists, would say that both science and religion won. Many people say, and Scopes' lawyers contended, that the theory of evolution was not actually in conflict with the Bible, that one could be a good Christian and believe in evolution too. They see Genesis, not as literally true, but as the guess of men without scientific knowledge as to how God achieved creation. They say that God used the process of evolution, for which they have abundant evidence, to create man and all living things.

But there is no doubt that, whether Scopes was guilty or not, the teaching of evolution won out. Today, in at least one university in Tennessee, the department of anthropology believes in teaching evolution aggressively. The professors do not merely give their students a smattering of evolution along with the rest of the natural sciences. They are told enough about the evidence of evolution so that they can see for themselves that it is a fact and not a

disputed theory.

Even at Dayton's William Jennings Bryan University, created in memory of the man who, some believe, gave his life in defense of the Bible, the theory of evolution is presented to the students. However, the school's catalogue says: "The attitude of the Science Department of this University is that the theory of evolution is not supported by scientific evidence. Facts of nature which prove the theory of evolution to be without sound basis are abundant and are brought to the attention of the student. The facts of science are found to be in harmony with the Bible, our foundation and guide."

There are still some traces of the kind of thinking which prompted the passing of an anti-evolution law. One government agency, which presents scientific exhibits to the public, avoids the use of the word "evolution" in those exhibits. The word "development" is used instead.

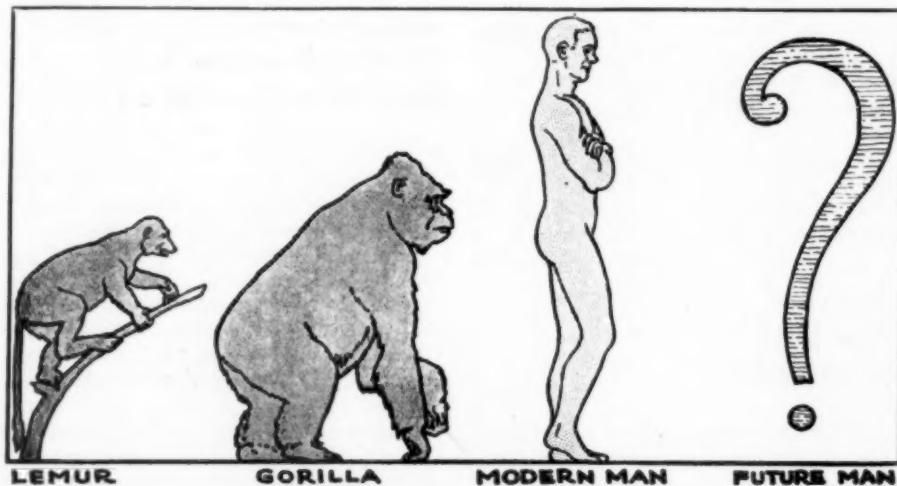
Twenty-five years ago scientists saw a threat to their freedom in anti-evolution laws. They mobilized against those laws. Eminent scientists traveled to Dayton to testify for the defense. Judge J. T. Raulston, however, ruled out their testimony.

Scientific meetings were devoted to the theory of evolution, to ways and means of combatting anti-evolution laws. Scientists realized they would have to band together if what they had learned over the years was not to be kept from the people.

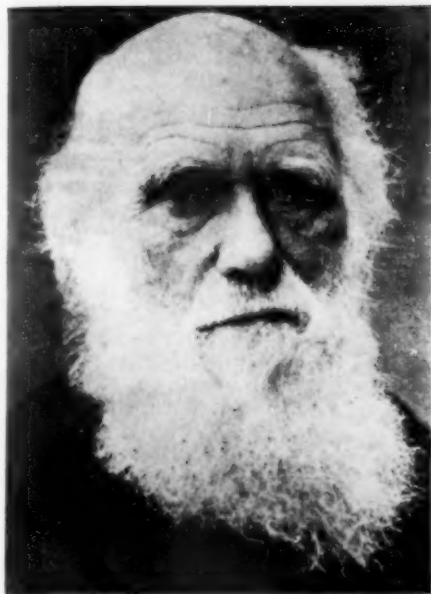
Present Counterpart

Looking back on it, scientists know they won that battle. But what about today? Do similar threats to scientific freedom exist today?

To this question, Dr. Howard Meyerhoff, executive director of the American Association for the Advancement of Science, says, "definitely, yes." He and other scientists feel that the threat to scientific freedom today is much greater than it was at Dayton.



EVOLUTION THEORY—Twenty-five years ago John Thomas Scopes, a young biology teacher, was indicted because he taught that man was related to the animals in the sketches above and was, in fact, descended from similar animals.



THEORY ORIGINATOR—Charles Darwin, author of the book "The Origin of the Species", first presented evidence for the evolution theory. He traveled around the world in his ship, "Beagle", to collect his evidence.

They see a tendency to restrict the freedom of scientists in the loyalty oaths some universities are asking of teachers, loyalty oaths much more strict than those asked of ordinary government employees. They see a threat in the fact that the House of Representatives could vote into the National Science Foundation bill loyalty provisions which, in the opinion of J. Edgar Hoover, director of the FBI, "would constitute a clear departure from accepted fundamental theories of American government and lay a foundation for criticism of the Bureau as a state police organization."

They think that the tendency of government agencies to classify more and more documents not only hampers science in its job of discovering new knowledge, but also keeps from the people things which they should know.

More important, they are wondering about an attitude which they think might be developing in this country—an attitude which tends to reject science and scientists. They think they see a fear of what science has wrought, a fear which is expressed in the acceptance of fantastic theories about the earth and the skies.

Twenty-five years ago, when Clarence Darrow placed William Jennings Bryan on the witness stand, he asked Bryan whether he really believed that Joshua made the sun stand still. Bryan said he did. He was scoffed at and, some say, as a result of that duel between the agnostic and the fundamentalist, he died a few days later.

But today, national magazines are presenting to the people a theory that the sun actually did stand still—or at least the earth stopped revolving—when Joshua asked it

to do so. This time it is not explained by the will of God, but by a theory concerning the actions of the planet Venus, a theory which is almost unanimously rejected by scientists.

Are scientists mobilizing today against these various threats as they did 25 years ago? Dr. Meyerhoff doesn't see enough evidence of mobilization. He says that most scientists are too anxious to stay within their own fields. But, he says, they'll have to join together and take action if they are to defend their own freedom and, ultimately, the people's freedom.

Science News Letter, April 29, 1950

ENGINEERING

Auto Diesel Engine To Power Indianapolis Racer

► A NEW lightweight diesel engine, designed for use in automobiles, will be used to power a car in the Indianapolis "500" automobile race classic this summer, it was revealed in Columbus, Ind., by Cummins Engine Company, Inc.

The new engine has been in use during the past few months in limited numbers in highway trucks. The particular one to be used in the racer is a highly supercharged version. It is a four-cylinder affair with a piston stroke of 401 cubic inches. It is capable of turning up to 4,000 revolutions per minute. It is now undergoing various tests.

Science News Letter, April 29, 1950



NEW SPEEDOMAX plots X vs. Y automatically

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MEDICINE

Life Span of Paraplegic

► THE 1,000 young adults who are made helpless by severe spinal cord injuries each year are now believed to have the opportunity to live out their normal life span.

Paraplegics, as these people are called, are able to produce professionally, commercially and industrially on every economic level, reports Dr. Morse P. Manson, of Birmingham Veterans Administration Hospital in Van Nuys, Calif., to the National Vocational Guidance Association.

Paralyzed from the waist down, these people suffer loss of movement and disturbance or loss of sensation in the lower extremities. The higher the level of cord injury the greater the disturbance to the bodily functions.

The injuries which occur suddenly and often at the peak of physical development have grave effects on the personality. Although rehabilitation is a great factor at present for injured veterans, the rehabilitation of the paraplegic will continue as long as there exist airplanes, falling, diving and accidents involving these and other activities.

A study of 115 male paraplegics, all of whom were veterans, showed that the occupational selections of paraplegics and non-paraplegics vary only slightly. After vocational counsel over 40% of the cases enrolled in schools or entered training while over 50% remained vocationally inactive.

The paraplegics engaged in some kind of vocational training showed marked preference for professional objectives while vocationally inactive paraplegics preferred skilled and clerical types of work. This group selected 52 different employment objectives ranging from farmer to elevator operator.

A follow-up study made by a training officer indicates that the adjustment patterns of paraplegics in training and non-paraplegics are very similar. "Instead of urging and encouraging paraplegics to continue to improve their work efforts, the training officer must be on the alert for indications of over-work and over-exertion."

Science News Letter, April 29, 1950

ENGINEERING

Cheaper, Smaller TV Sets

► A CUT in both cost and size of television receivers is promised by a manufacturing method described to the Institute of Radio Engineers by Dr. M. U. Cohen of Balco Research Laboratories, Newark, N.J. The use of prefabrication and printed circuit principles is the basis of the process.

The new manufacturing methods presented by Dr. Cohen resulted from investigations made for the U.S. Army Signal Corps. They apply to radio construction as well as to television. Printed circuits, instead of wire, use painted tracks of metallic ink on plate. One silver ink used is a solution of silver oxide. The printed circuit is a two-dimensional affair requiring little space.

The ordinary radio and television set

contains from five to 30 tubes and hundreds of other parts, Dr. Cohen stated. In present manufacturing methods, all of these parts are assembled into a set and individually wired and soldered into place. A high degree of skill and long assembly lines are needed.

The new method prefabricates all this necessary wiring before any assembly is started. The complete wiring pattern is first laid out in the engineering laboratory on a plastic or ceramic chassis plate using metal paints, wires, or foil as conductors. The various radio parts are then soldered into position.

When the set has been tested and perfected, the final wiring pattern is copied photographically, and then reproduced au-

tomatically on a printing press on chassis plates similar to the original. All the wiring is thus printed at very high speed and at low cost.

The radio parts are then put into place on the printed wiring, a prepared stencil or pattern being used to see that the parts are placed only in their correct positions. This operation can be done by hand without tools.

When the parts have been placed into position, they are all clamped to the printed plate. Plate and parts are then dipped into a bath of molten solder so that all are soldered to the printed wires at the same time. With this method, Dr. Cohen emphasized, printed circuits may be used in all kinds of radio and television equipment.

Science News Letter, April 29, 1950

METEOROLOGY

Some Dust Bowl Relief; East Colder than Normal

► SOME relief in the form of rain may be expected between April 15-May 15 for the nation's dust bowl farmers, the Weather Bureau predicted. Normal rains are expected by the bureau's extended forecast section in parts of Nebraska, in Kansas, Missouri, Oklahoma, parts of Texas, New Mexico and Arizona, as well as all the far western states.

"Abundant" is the word the Weather Bureau uses for the amount of rain expected during the latter part of April and first part of May from Texas eastward and north-eastward through the Gulf states, middle Atlantic states and New England. However, Jerome Namias, chief of the extended forecast section, defined "abundant" as "greater than normal."

Northern plains states are in for sub-normal rains, the Weather Bureau said.

Prediction of normal rainfall in the dust bowl states will be a relief to federal soil conservation officials who said the situation was "pretty bad" there.

"Although we have enough know-how so that the situation cannot become as bad as it was during the 1930's," said Dr. Mark L. Nichols, chief of research for the Department of Agriculture's soil conservation division, "if there is no rain there soon, there is little we can do to help."

The eastern half of the country can expect a little but not much relief from the recent colder-than-normal temperatures. The extended forecast section predicts that temperatures from mid-April to mid-May will average below normal in the East, although they will be milder than in the first part of April.

West of the continental divide, temperatures will be above normal. Near normal temperatures are predicted for the Gulf Coast, northern New England and a strip extending from the Dakotas southward to west Texas.

Science News Letter, April 29, 1950

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CRIMINOLOGY

Rural Crime Increases At Twice Rate of Cities

➤ **RURAL** crime increased at twice the rate it was going up in the cities during 1949, according to the FBI.

Over the whole year, a serious crime was committed every 18 seconds, the annual "Uniform Crime Reports" of FBI director J. Edgar Hoover reported.

Sheriffs' offices, rural police departments and State police reported an 8.5% jump in country crime, while the larger cities showed a 4.2% increase in serious crimes.

The nation-wide statistical survey showed another twist. "The frequency with which various types of crimes are committed appears to fluctuate with the different seasons of the year," Mr. Hoover reported.

Robberies, burglaries and auto thefts—all crimes against property—tend to occur most often in the winter months, hitting a high in December. For larcenies, rape and aggravated assaults, on the other hand, the summer months seem to be the time the criminal is more liable to attack.

The FBI points out that the long winter nights aid acts of stealth, while warm weather and long daylight hours are more favorable to personal contact.

"During the average day in 1949," Mr. Hoover reported, "there were 293 persons killed or assaulted; 162 robberies were committed; over 1,100 places were burglarized, more than 440 cars were stolen, and there were 2,800 thefts under the general larceny classification."

Strangely, the major types of crimes reported on, all rose during the past year except murder, negligent manslaughter and auto theft.

Science News Letter, April 29, 1950

ENGINEERING

Two New Man-Made Lubricants Available

➤ **TWO** new synthetic lubricants were made known at the American Chemical Society meeting in Houston, Tex.

A high-quality synthetic lubricant can meet the nation's needs when the premium oil fields of Pennsylvania and the Mid-continent states run dry.

Synthetic lubricants which have antiwear action 18 times better than petroleum oil have given superior service from temperatures well below zero to 300 degrees above.

One new product is made from abundant raw materials such as coal, oil shale, and refinery by-products. It boasts "quality standards not obtainable from petroleum oils without elaborate procedures." It was described by F. M. Seger of Paulsboro, N. J., research chemist for the Socony-Vacuum Oil Company.

In this synthetic process, an intermediate

chemical called 1-decene is produced from coal or one of the other raw materials, and 1-decene in turn is converted into an excellent synthetic lubricant by a simple heat treatment in conventional refinery equipment.

Dr. W. H. Millett of the Union Carbide and Carbon Corporation, New York, described the second new series of synthetic oils, made from natural gas or petroleum hydrocarbons. It has all the other desirable

qualities of high-grade lubricants, exerts a solvent and cleansing action on the gums produced by ordinary oils, and can be made in water-soluble as well as insoluble form, Dr. Millett declared.

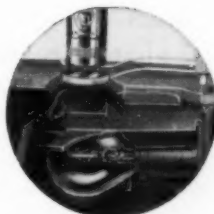
Through control of the chemical reaction by which these "polyalkylene glycol" lubricants are made, oils of any practical density can be produced, which gives them a wide range of usefulness.

Science News Letter, April 29, 1950

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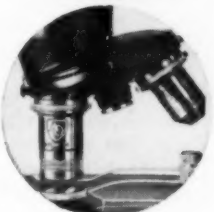
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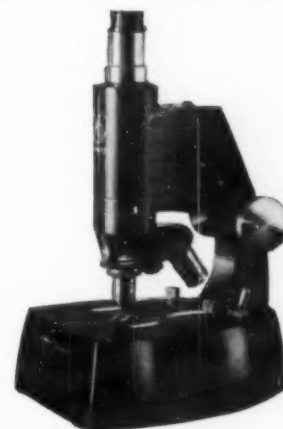
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Iris

► BOTH those who like to walk out to meet the Spring and those who are content to watch it blossom forth in the windows of the local florist keep an eye peeled for members of the iris family.

It is unlikely that either will be disappointed for it is a numerous and popular clan. There are about 800 species in the iris family, known technically as the iridaceae. One genus within the family is the iris itself. Other important genera are the crocus and the gladiolus.

Iris comes in bright, assertive colors which is probably why the name "iris," Greek for rainbow, was applied to them. Irises are widely distributed throughout the north temperate zone. Many species have been imported and they have been extensively hybridized to develop favored horticultural types. The best known native iris is the blue flag which is generally found growing in moist or marshy terrain.

The fleur de lis, the heraldic device associated with the French royal coat of arms and which is frequently seen in pins and other jewelry designs, is thought to be a conventionalization of the white iris. However its claim is not undisputed, the white lily being another contender for the honor.

Whether the iris was the inspiration or not, in any case the fleur de lis is a very ancient design which appears in Indian, Egyptian, and Etruscan decoration. Some

scholars think it has nothing to do with the iris or any other flower, being merely a design based on the shape of certain weapons, notably arrow or spear heads.

The iris flower with its large leafy petals curving upward and drooping gracefully outward and down is remarkably designed. It is a piece of ingenious botanical engineering organized so that a honey-sucking bee will pollinate any flower but the one from which it picked up the pollen.

The bee comes in for its landing on the broad inviting surface of the outer petal. As the bee (or other insect) crawls in to tap the nectar, it brushes the stigma which is conveniently set for this purpose. Thus any pollen from flowers previously visited will brush off on the stigma, resulting in pollination.

Continuing on its way to the honey, the bee brushes the anther, picking up more pollen. When it is ready to leave, the bee must back out the way it came, but this time it touches the non-receptive lower surface of the stigma. In this way the flower does not pollinate itself.

Science News Letter, April 29, 1950

PHYSICS

Geiger Counters Will Help Find New Oil Pools

► GEIGER and other radiation counters may soon be standard equipment for searching out new pools of oil.

Possibility of the use of radiation detectors in hunting oil was discussed at the meeting of the American Physical Society, Oak Ridge, Tenn. Drs. Clark Goodman, Charles W. Tittle and Henry Faul developed this application while working at the Massachusetts Institute of Technology.

They found that the penetration of solid materials by neutrons and gamma rays gave an index of the structure and composition of the surrounding cased drill holes. Counters can be used to detect the radiation from formations near these holes.

They also found that when a portable neutron source was lowered into well casings, the neutrons caused gamma rays to be emitted from the surroundings. These rays can likewise be measured to indicate the structure of surrounding formations.

When measurements of the amount of radiation are made at the same time at several points along the axis of a drill hole near a porous formation, they can be used to tell whether the formation contains oil or water, either salt or fresh.

These measurements can also indicate the efficiency of other techniques now used to locate oil reservoirs. This use of radiation detectors will increase our knowledge of conditions under the earth's surface, they state.

Science News Letter, April 29, 1950

MINING

Mineral Stockpiling Might Cause Later Mining Slump

► STOCKPILING domestic metals under the present postwar program may result in a serious decline in the mining industry at a later date, the American Zinc Institute was told by Dr. James Boyd, director of the U. S. Bureau of Mines.

"It is well to remember that stockpile procurement must come from productive capacity in excess of current industrial requirements," he said. "Consequently the termination of stockpile acquisition is bound to leave idle productive capacity, unless it can be timed to bridge the gap between past peaks and growing commercial demand."

"It is unlikely that such a favorable coincidence will occur," he continued. "Consequently I feel that the mining industry must be prepared for a period of retrenchment when stockpiling ceases."

The stockpile must provide an ample available supply of strategic materials for national security, and it is evident that an effective stockpile must be well balanced at all times, he stated. It is undesirable that there be an excess supply of one metal to the detriment of others.

National security as afforded by stockpiles is not a matter that can be reduced to a secondary position, he emphasized. On the other hand, an active and producing domestic mineral industry is a source of national strength, and has been so recognized by the stockpiling authorities.

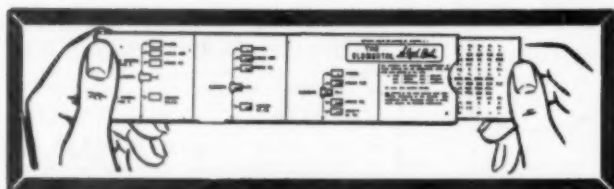
Perhaps there is a silver lining to the cloud which at the present moment is enveloping the non-ferrous mining industry, Dr. Boyd stated.

"We must assume that through our help, and their own efforts, the European economy will grow. I am convinced that the time will come when metals produced abroad will be consumed largely by the countries involved."

"It will mean the loss of certain foreign markets to us, but on the other hand it should react to our domestic advantage in that there would be less foreign metal and mineral available for marketing within the United States. Increased demand for our industrial products should increase the domestic demand for minerals."

Science News Letter, April 29, 1950

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Books of the Week

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THE ADJUSTMENT OF THE BLIND—Hector Chevalign and Sydel Braverman—*Yale University Press*, 320 p., \$4.00. How a human being must adjust physically, mentally and emotionally to loss of sight.

AGRICULTURAL PROGRESS IN THE COTTON BELT SINCE 1920—John Leonard Fulmer—*University of North Carolina Press*, 236 p., illus., \$3.50. A study of the advances made during recent years.

A BASIC BREAKFAST PATTERN: Teacher's Source Book—E. V. McCollum, Ed.—*Cereal Institute*, 21 p., illus., paper, free upon request to publisher, 135 South La Salle St., Chicago 3, Ill. Information on breakfast and its importance to teen-agers and adults.

BEGINNER'S GUIDE TO FRESH-WATER LIFE—Leon A. Hausman—*Putnam*, 128 p., illus., \$2.00. A handy reference for the nature lover. Includes over 250 of the most common forms of animal life.

BREAST DEFORMITIES AND THEIR REPAIR—Jacques W. Maliniac—*Grune & Stratton*, 193 p., illus., \$10.00. For the surgeon, gynecologist, and obstetrician, interested in mammoplasty surgery but without special experience in the field. Many helpful illustrations.

CAREERS FOR YOUNG AMERICA IN THE ARMY AND AFTER—Reuben Horchow—*Public Affairs Press*, 226 p., \$3.25. This book tells what the army has to offer young men and women. The introduction is written by General Omar Bradley.

THE CENTENNIAL OF THE SHEFFIELD SCIENTIFIC SCHOOL—George A. Baisell, Ed.—*Yale University Press*, 206 p., illus., \$3.00. Some of the papers presented at the celebration of the close of the first century of the Sheffield Scientific School in 1947.

CHART OF THE NUCLIDES—Knolls Atomic Power Laboratory—*General Electric*, rev. ed., 1 p. illus., paper, free upon request to publisher, Dept. 6-221, Schenectady 5, N. Y.

CHEMOTHERAPY OF LEUKEMIA AND LEUKOSARCOMA—William Dameshek and others—*Grune & Stratton*, 53 p., illus., paper, \$4.75. A reprint of many valuable illustrations exhibited at the American Medical Association Convention, Atlantic City, N. J., June 1949.

EDUCATIONAL PSYCHOLOGY—Edwin R. Guthrie and Francis F. Powers—*Ronald*, 530 p., illus., \$4.00. A college textbook.

FERTILITY IN MARRIAGE: A Guide for the Childless—Louis Portnoy and Jules Saltman—*Farrar, Straus*, 259 p., \$3.00. Offers some practical advice on how to have children. Written in non-technical terminology.

FRONTIERS IN COLLOID CHEMISTRY: Vol. VIII—R. E. Burk and Oliver Grummitt, Eds.—*Interscience*, 157 p., illus., \$4.00. The latest advances in colloid chemistry are presented. The material formed the bases for Western Reserve University's annual lecture series on "Frontiers in Chemistry."

GEOCHEMISTRY—Kalevo Rankama and Th. G. Sahama—*University of Chicago Press*, 911 p.,

illus., \$15.00. A compilation of much of the present day knowledge in this field. This monograph incorporates a large part of the extensive European literature.

GP: Vol. I; No. 1—F. Kenneth Albrecht, Ed.—*American Academy of General Practice*, 127 p., illus., paper, \$5.00 a year to members of the Academy; \$10.00 to others; \$1.00 per copy. A new medical journal which is dedicated to cover the wider aspects of medicine rather than just isolated chips.

A HUNDRED YEARS OF ARCHAEOLOGY—Glyn E. Daniel—*Duckworth* (U. S. Distributor: *Macmillan*), 343 p., \$3.50. A discussion of some of the significant discoveries and developments in this field.

ISAAC NEWTON—E. N. Da C. Andrade—*Chanticleer Press*, 111 p., illus., \$1.75. A biography of one of the world's greatest scientists.

THE LAW OF MEDICINE—Parnell Callahan and Justin Callahan—*Oceana Publications*, 80 p., paper, \$1.00 (Cloth: \$2.00). Information on laws relating to the practice of medicine.

LUCRETIVS ON THE NATURE OF THINGS—W. Hannaford Brown, Translator—*Rutgers University Press*, 262 p., \$5.00. A treatise on the Epicurean doctrine of the physical basis of the universe. Translated from the Latin.

MARRIAGE ANALYSIS: Foundations for Successful Family Living—Harold T. Christensen—*Ronald*, 510 p., illus., \$4.50. The author attempts an analysis of some of the basic problems of marriage such as personality backgrounds, sexual adjustment, and parenthood.

MODERN SCIENCE TEACHING: A Revision of Modern Methods and Materials for Teaching Science—Elwood D. Heiss, Ellsworth S. Obourn and Charles W. Hoffman—*Macmillan*, 462 p., illus., \$4.50. A textbook for those courses in methods of teaching science.

MY THREE YEARS IN MOSCOW—Walter Bedell Smith—*Lippincott*, 346 p., illus., \$3.75. A report by our ambassador to Russia from March 1946 to March 1949.

NUCLIDES AND ISOTOPES—James Stokley—*General Electric*, 7 p., illus., paper, free upon request to publisher Dept. 6-221, Schenectady 5, N. Y. This booklet was prepared to accompany the General Electric Research Laboratory's "Chart of the Nuclides" listed elsewhere in this column. The author is astronomy writer for Science Service.

ON BEING HUMAN—Ashley Montagu—*Schuman*, 125 p., \$1.95. The author presents data showing that man follows the principles of co-operation rather than conflict.

PEOPLE, FOOD, MACHINES: Bold New Program Series No. 5—Stephen Raushenbush—*The Public Affairs Institute*, 80 p., illus., paper, 50 cents. The views of the author on how to solve the world food problem.

PHOTOELASTICITY: Principles & Methods—H. T. Jessop and F. C. Harris—*Dover*, 184 p., illus., \$3.50. Written for those who wish to undertake practical work on stress-exploration.

PROGRESS IN BIOCHEMISTRY: A Report on Biochemical Problems and on Biochemical Research Since 1939—Felix Haurowitz—*Interscience*, 405 p., illus., \$7.50. The author has compiled the major developments for the past ten years, and in general discusses only human and animal biochemistry.

THE PSYCHOLOGY OF EXCEPTIONAL CHILDREN—Karl C. Garrison—*Ronald*, rev. ed., 517 p., illus., \$4.50. Brought up-to-date with many new case histories added.

QUIZ ON RAILROADS AND RAILROADING—*Association of American Railroads*, 7th ed., illus., paper, free upon request to publisher, Transportation Building, Washington 6, D. C. Latest available information on a wide range of railway topics. In question and answer form.

REFLECTIONS OF A PHYSICIST—P. W. Bridgman—*Philosophical Library*, 392 p., \$5.00. A compilation of Dr. Bridgman's non-technical writings. The author was Nobel Prize winner in Physics, 1946.

SOIL, FOOD AND HEALTH: "You are what you eat"—Jonathan Forman, Ed.—*Friends of the Land*, 342 p., illus., \$4.50. A record of the sessions of the National Nutrition Conference held annually at Ohio University.

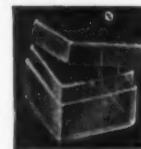
30TH ANNUAL REPORT: Institute of International Education—*Institute of International Education*, 158 p., paper, 25 cents. The report lists the American students abroad, foreign students in the United States and the different co-operating groups, for the year 1948-49.

THIS EARTH OF OURS—Past and Present—Caleb Wroe Wolfe—*Earth Science*, 374 p., illus., \$5.00. An introductory geology text stressing the philosophical side of the science.

YEAR BOOK No. 48—July 1, 1948-June 30, 1949 with Administrative Reports through December 9, 1949—*Carnegie Institution of Washington*, 258 p., paper \$1.00 (Cloth: \$1.50). Reports of the departmental activities and co-operative studies including those on astronomy, terrestrial sciences, biological sciences and historical research.

Science News Letter, April 29, 1950

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✿ **GARBAGE CAN** and rat trap in combination, recently patented, utilizes the odor of the garbage as bait and needs no resetting as captured rodents are dropped into a chamber below the main part of the can. Entrance for the rats is a hole low down on the side of the container.

Science News Letter, April 29, 1950

✿ **JACK AND WHEEL-REMOVER** is a low, roller-mounted, aluminum frame with the jack at one end and operating lever at the other. After a wheel is raised, the frame can be rotated under it. A grip grasps the wheel and removes it easily by mechanical power.

Science News Letter, April 29, 1950

✿ **SWIVEL-ACTION WASHERS** for household faucets eliminates all friction between the washer and the faucet seat, thus decreasing wear and giving life perhaps 20 times as long. It is a household version of a type already tested in hotel and hospital applications.

Science News Letter, April 29, 1950

✿ **WATER WHEEL**, for fun for swimmers, is a six-foot inflatable affair consisting of two air-filled rings with a connection between in which are eight large circular holes. It can be used as a rolling "ducker" or in sidewise position as a float.

Science News Letter, April 29, 1950



✿ **SUN-TAN** from a coin-machine, shown in the picture, is accompanied by rays from a heat lamp, the combination being claimed to be more effective. It is a safe unit to use because it is fitted with a timer to regulate exposure and also a tape for measuring the proper exposure distance.

Science News Letter, April 29, 1950

✿ **SPECIAL NAILS** of high carbon steel, developed as an aid in television installations, can be driven directly into a brick

wall to hold antenna lead wires. Nails are provided with a polyethylene insulator at the tip. They can be used also as a mast coupler.

Science News Letter, April 29, 1950

✿ **ELECTROSTATIC** generator, which operates 20 minutes with only one winding of its spring motor, is designed to replace the cumbersome battery formerly used in a military instrument by means of which soldiers could see in the dark. This so-called sniperscope utilizes invisible rays of infrared light.

Science News Letter, April 29, 1950

✿ **THREE-IN-ONE** household window has a regular sash, storm window and screen all in a unit to fit into the window frame. They move up and down independently of each other, each in its own channel, and are not bulky because they are made of aluminum or aluminum and stainless steel.

Science News Letter, April 29, 1950

✿ **PENCIL HOLDER**, which holds the pencil behind the hand when not in use, consists of a wrist band of flexible material and a forward projecting arm. At the end is a pivoted extension to hold the pencil which permits it to be turned down into writing position and later retracted by a coil spring.

Science News Letter, April 29, 1950

Do You Know?

Radio signals flash through space at a rate of 186,000 miles a second.

People rendered voiceless by the removal of the larynx because of cancer are taught to speak again by a special technique.

Nose prints of identical twin calves are likely to be similar, just as finger prints of identical humans are often similar.

Noise is measured by scientists in degrees, called decibels; ordinary conversation averages 40 decibels and a noisy office often hits 70 decibels.

Some lawn grass seeds are given a chemical coating to protect them after planting from the ravages of cold, dampness and soil fungi that may prevent germination.

Californium, a chemical element created through atomic bombardment at the University of California, is the 98th and heaviest chemical element; it was transmuted from isotope 242 of curium.

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